ZT1000Y

MORI SEIKI
ZT1000
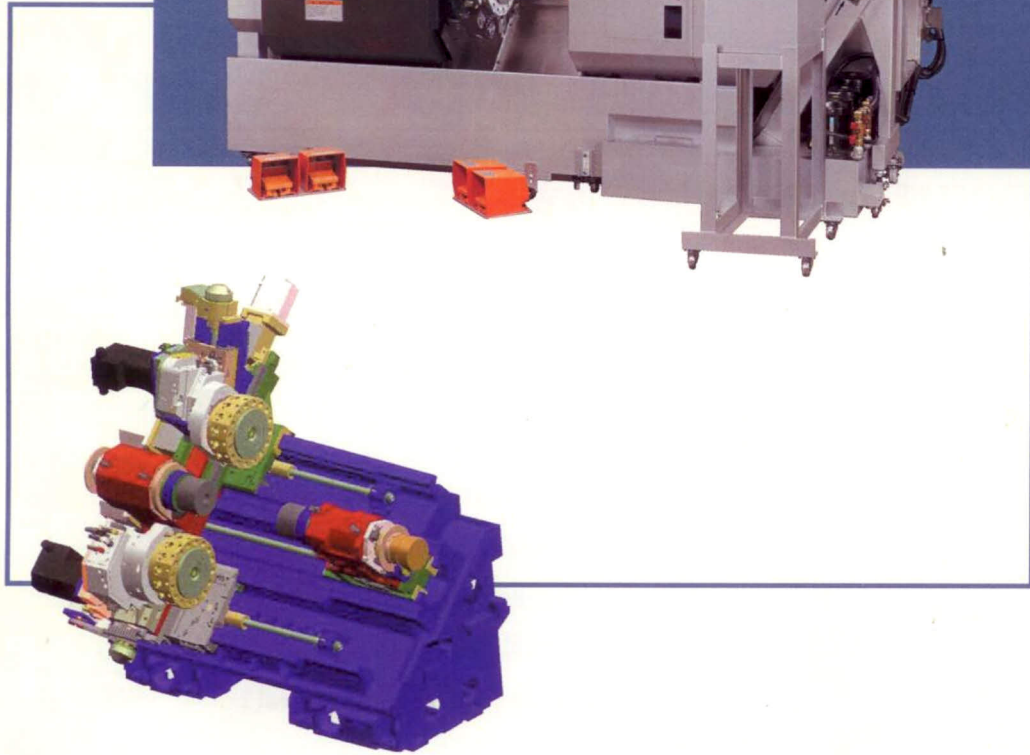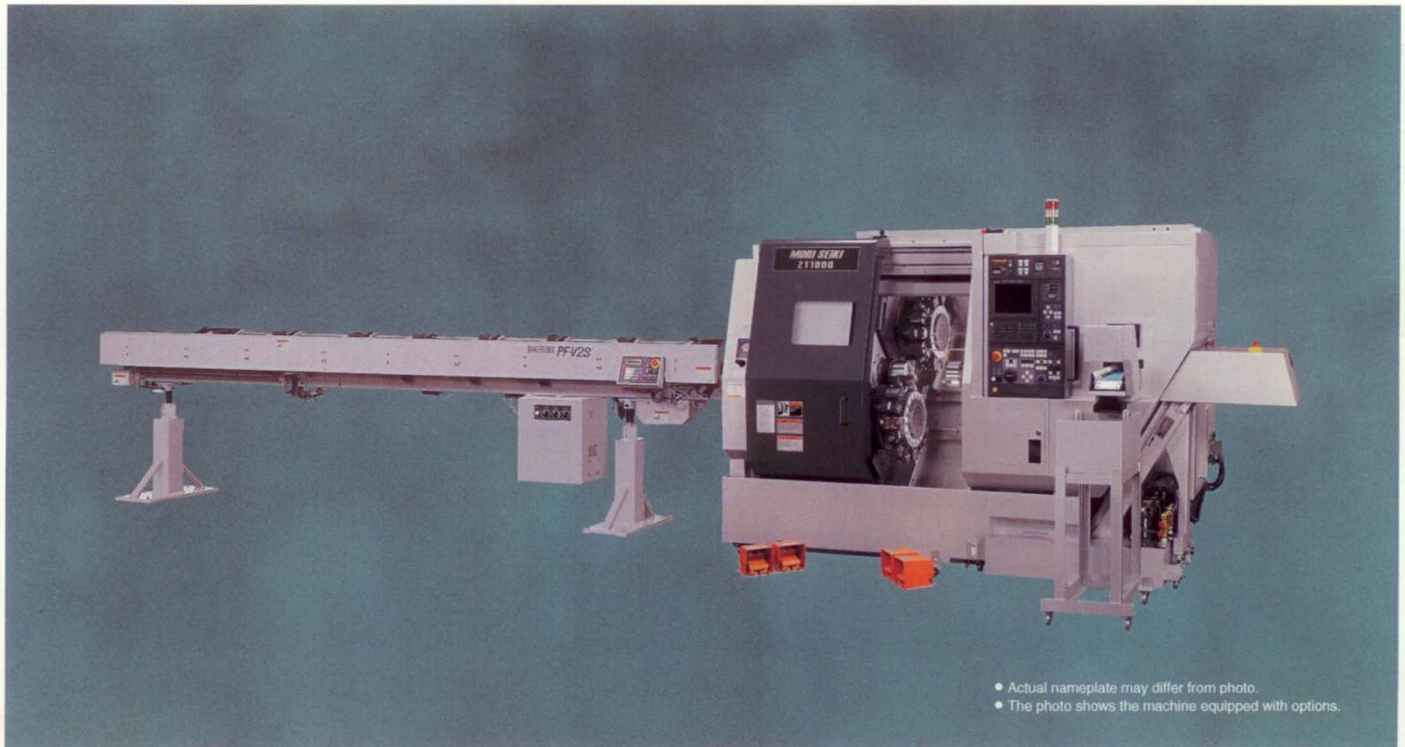
- Actual nameplate may differ from photo.
- The photo shows the machine equipped with options.

Turning center combines Y-axis control, two spindles, and two turrets in a compact package.

ZT1000Y

Multi-axis configuration is optimum for process integration ··· **4**
Maximum of eight control axes with two spindles and two turrets

Space-saving design ··· **5**
Floor space 5.6 m² (60.3 ft²)

Y-axis for a high level of integrated machining ··· **7**
Y-axis travel 80 mm (3.1 in.)

A turning center that offers high precision contour control ··· **7**
C-axis rapid travers rate 400 min⁻¹

High-speed spindle ··· **8**
$8,000$ min⁻¹ $22/18.5$ kW (30/24.7 HP)
(15 min/cont) <High speed>

Fast assured-indexing turret ··· **8**
Turret indexing time <1-station> 0.2 sec.

Machining capacity ··· **9**
Heavy-duty cutting 162.7 mL/min (9.9 in³./min)
Depth of cut 6 mm (0.24 in.)

Proven high precision ··· **9**
Roundness 0.43 μm Surface roughness 1.07 μm Ry

System expansion to boost your productivity (option) ··· **11**
In-machine traveling parts catcher system
Bar feeder system

Sample workpieces ··· **6**

Rigid base ··· **10**

Convenience and safety ··· **10**

Standard & optional equipment ··· **12**

Standard & optional features ··· **13**

New generation operating system (MAPPS*) ··· **14**

NC unit specifications (MSG-501) ··· **15**

Machine specifications ··· **16**

* Mori Advanced Programming Production System
- Figures in inches were converted from metric measurements.

Laborsaving functions and a spindle configuration that are ideal for integrating processes and lowering operation costs.

Axis configuration

The spindle opposing the main spindle also accepts a 6-inch chuck, and the 12-station turrets that can move along the X and Z axes have been placed above and below the spindle center.

The self-contained 2-process design achieves ideal process balance.

Compact body

Standard equipment includes a 6-inch chuck, optimum for small diameter barstock machining from ϕ 20 mm $-$ ϕ 40 mm (ϕ 0.7 in. $-\phi$ 1.5 in.). Matches the output of multiple specialized machines while providing excellent space utilization.

Turret

The quick-change type turret allows rapid switching among tool holders to match the type of machining required.

This feature streamlines tool setting, decreasing the amount of setup.

DDS* motor is used

A powerful DDS* motor delivers consistent output to the spindle across a wide high-torque range. Built into the headstock, the motor ensures stable speed and highly efficient drive while minimizing vibrations. This kind of performance helps improve surface roughness and roundness.

Y-axis control

The Y-axis gives users control in the direction perpendicular to the tool axis and workpiece axis, making offset key-grooving and off-center drilling and tapping easy.

Automatic operation support

There are a variety of loader systems that automate the entire machining process from raw material supply to ejection of the finished product. An example of this is a bar feeder system that handles all aspects of bar machining, allowing the construction of different kinds of unmanned systems.
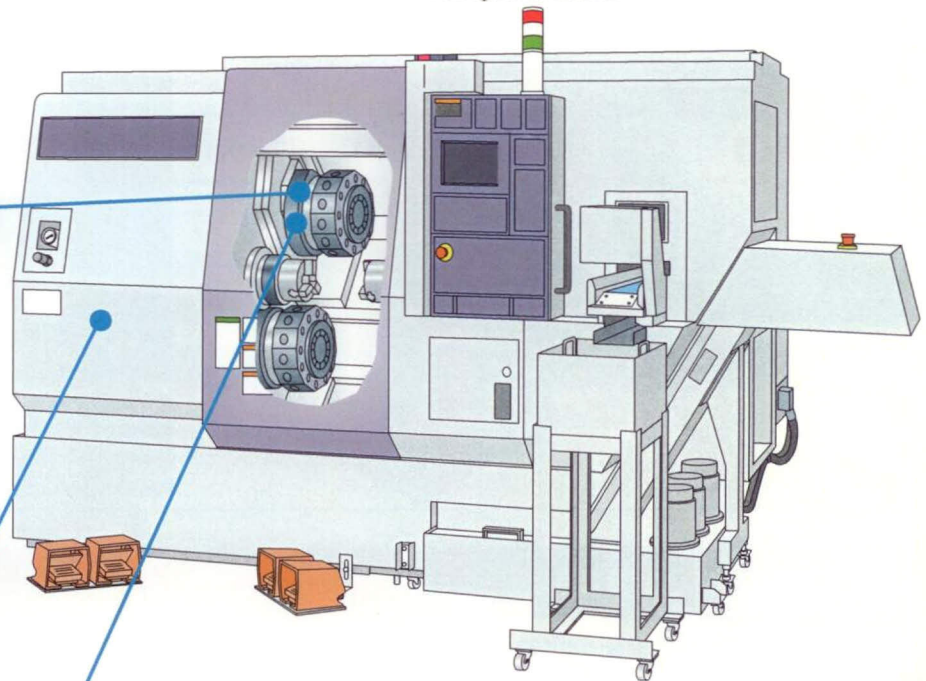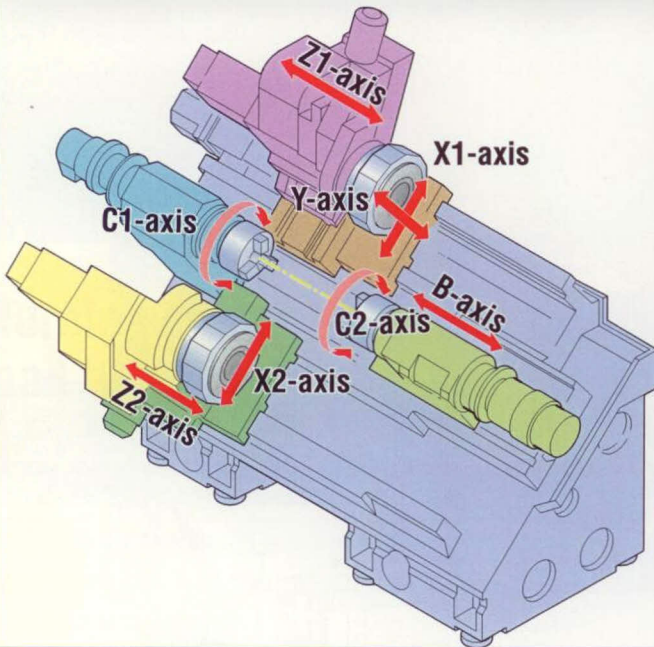
* Direct Drive Spindle

Advantages of a two spindle and two turret lathe

Improved multiple process accuracy	Balanced process time distribution
Process integration	Extends unmanned operation time
Reduced setup time	Reduces work in process inventory

Axis configuration

Z1-axis
X1-axis
Y-axis
C1-axis
B-axis
C2-axis
X2-axis
Z2-axis

■ Maximum of eight control axes with two spindles and two turrets

Turret 1
Y-axis
Z1-axis
X1-axis
B-axis
C1-axis
C2-axis
Headstock 1   X2-axis   Headstock 2
Z2-axis
Turret 2
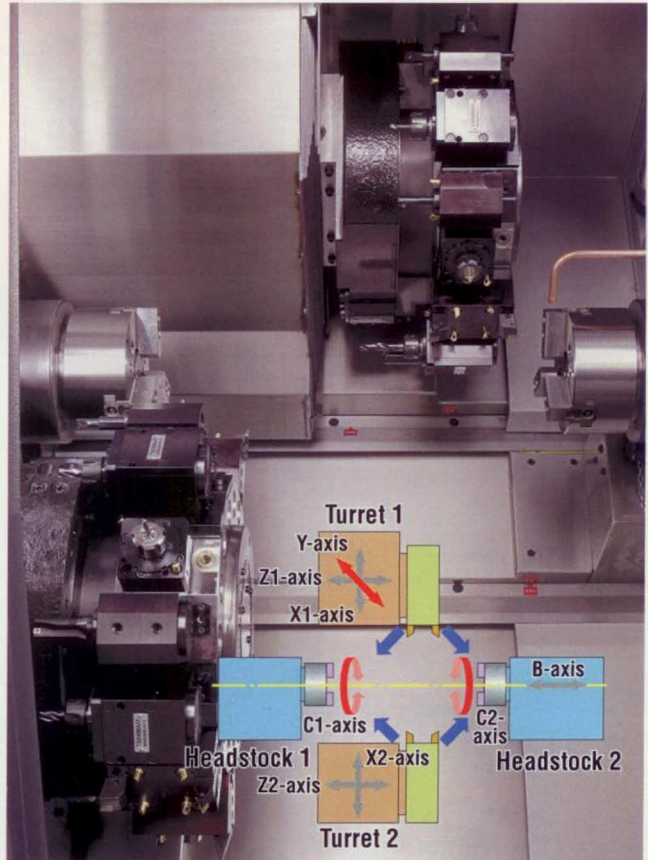
Provides access to both spindles for both the first and second turret ▶ Achieves optimum process time balance

---

Process integration   Greatly reduced machining time.


Material <JIS>: SUS304

■ Conventional process

1st process	CNC Lathe+Bar feeder (Number of cutting and turning processes: 7)	1 min. 5 sec./pc.
2nd process	Vertical Machining Center (Number of machining processes: 12)	2 min. 3 sec./pc.
3rd process	Vertical Machining Center (Number of machining processes: 8)	1 min. 16 sec./pc.
Total		**4 min. 24 sec./pc.** [*1]

*1 Includes workpiece clamping time, workpiece removal time, workpiece positioning time, tool breakage detection time and APC time.

■ ZT1000Y

ZT1000Y+Bar feeder
(Number of cutting and turning processes: 7
Number of milling processes: 17)

One machine   **2 min. 26 sec./pc.** [*2]

Conventional process   4 min. 24 sec./pc.
1st process   2nd process   3rd process
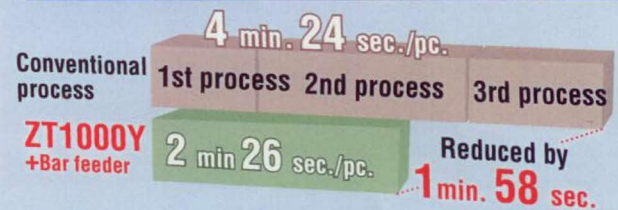
ZT1000Y +Bar feeder   2 min 26 sec./pc.   Reduced by 1 min. 58 sec.

Reduced by

Compared to conventional process   **1 min. 58 sec.**

*2 Includes workpiece clamping time and part catcher (workpiece removal) time.
● Optional equipment is required to obtain the machining times described above.

JIS: Japanese Industrial Standard

Space saving, labor saving — Realizes overall low-cost operation.

Impact of introducing a composite machining center

Previous system
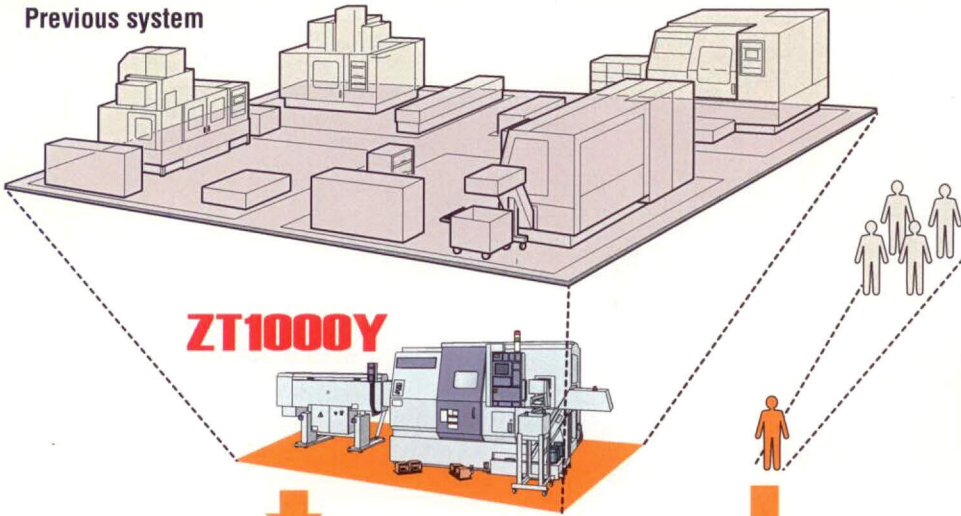
- ○ Vertical Machining Center×2
- ○ CNC Lathe×2
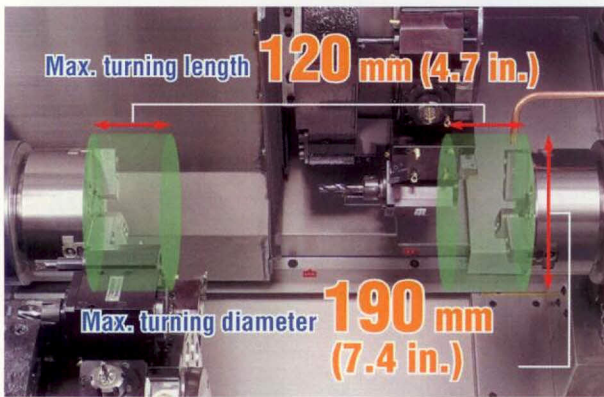- ○ Material stocker
- ○ Operators: 4

↓

- ○ ZT1000Y
- ○ Bar feeder
- ○ Operators: 1

ZT1000Y

■ Effective after change

Total time reduction

(Space-saving) + (Less manpower required) ➡ (**Cost reduction**)

Working area — A spacious work area with an overall compact machine size.

Max. turning length **120** mm (4.7 in.)

Max. turning diameter **190** mm (7.4 in.)

Compact body

mm (in.)

1,995 (78.5)
2,797 (110.1)
2,010 (79.1)

Floor space comparison

Company A **6.0** m² (64.6 ft²)

ZT1000Y **5.6** m² (60.3 ft²)

Travel

X-axis
135 mm (5.3 in.)

B-axis
510 mm (20.1 in.)

Z-axis
Turret 1: **450** mm (17.7 in.)
Turret 2: **440** mm (17.3 in.)
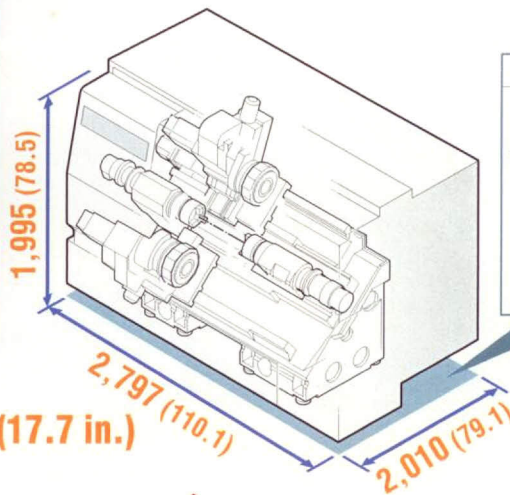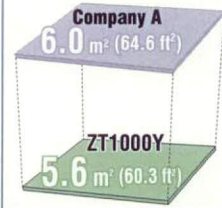
Max. turning length comparison

Company A **90** mm (3.5 in.) ➡ ×1.3

ZT1000Y **120** mm (4.7 in.)
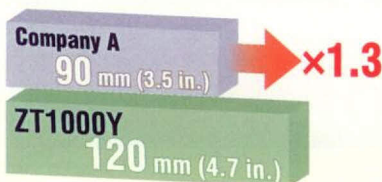
Z-axis travel comparison

Turret 1
Company A **380** mm (15.0 in.) ➡ ×1.2

ZT1000Y **450** mm (17.7 in.)

Turret 2
Company A **125** mm (4.9 in.) ➡ ×3.5

ZT1000Y **440** mm (17.3 in.)
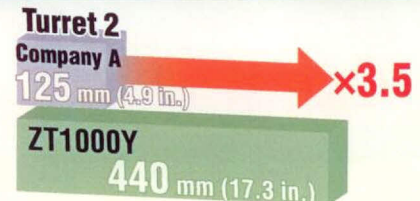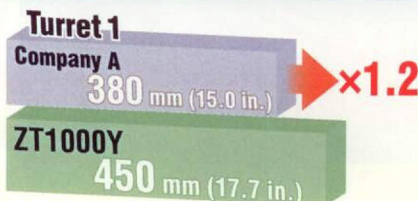
■ Sample workpiece machined with the ZT1000Y
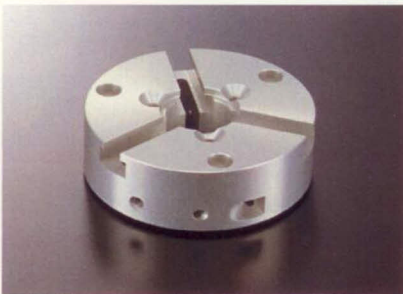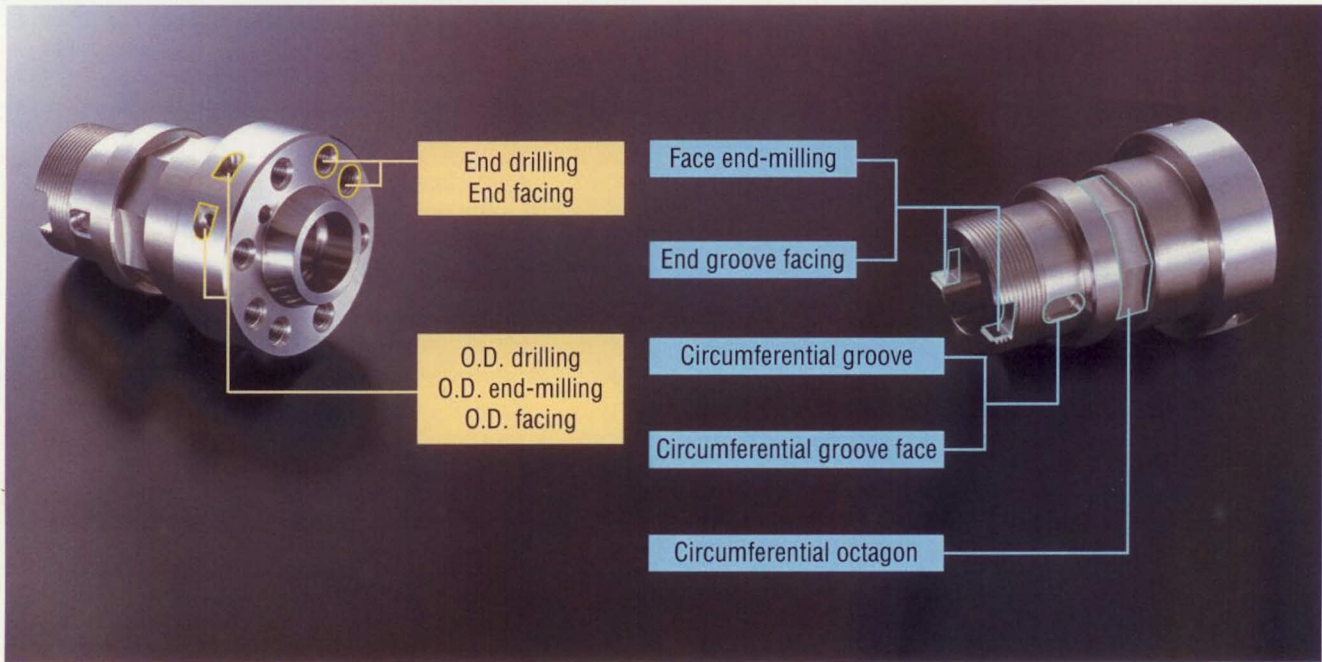
End drilling
End facing

Face end-milling

End groove facing

O.D. drilling
O.D. end-milling
O.D. facing

Circumferential groove

Circumferential groove face

Circumferential octagon

Sample workpiece with Y-axis control

Sample workpiece with Y-axis control
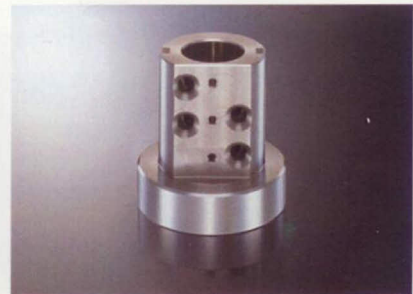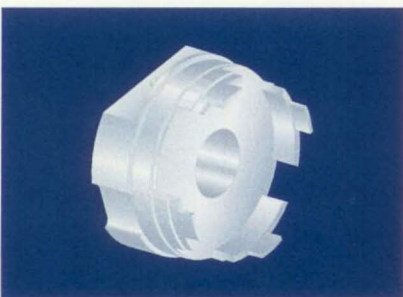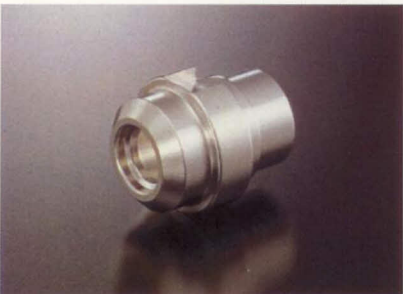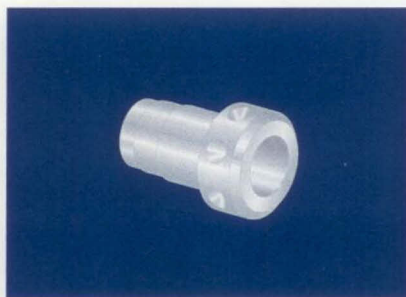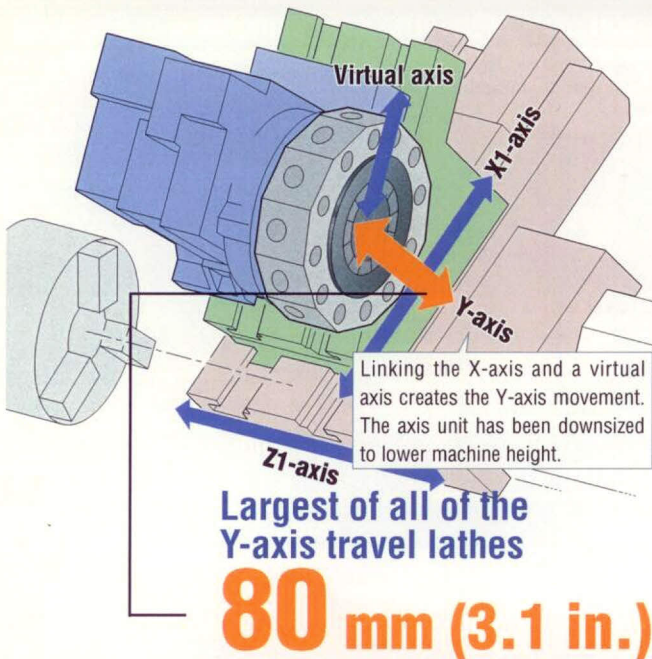

Sample workpiece with Y-axis control

Sample workpiece with Y-axis control

Y-axis control

Virtual axis

X1-axis

Y-axis

Z1-axis

Linking the X-axis and a virtual axis creates the Y-axis movement. The axis unit has been downsized to lower machine height.

Largest of all of the Y-axis travel lathes

80 mm (3.1 in.)

Y-axis machining range

mm (in.)

- **Circumferential grooving on a turning center with Y-axis control**
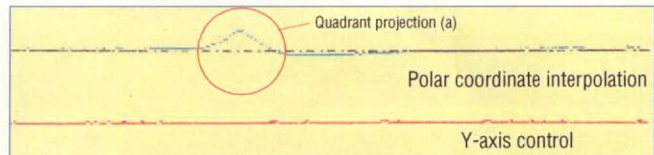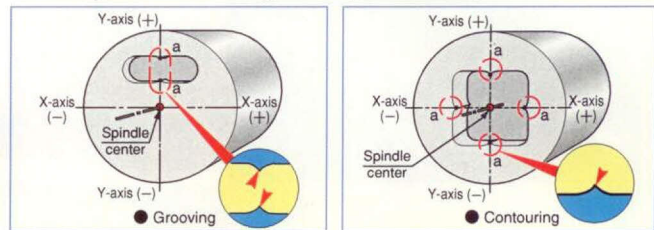
Milling without Y-axis control
It is hard to match the width of outer (a) and inner (b) grooves.
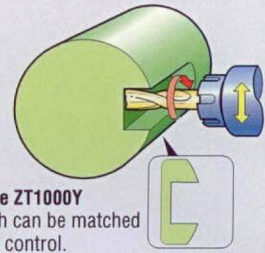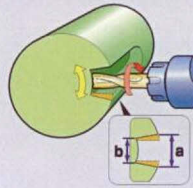
Milling on the ZT1000Y
Groove width can be matched using Y-axis control.

- **Comparison between polar coordinate interpolation and Y-axis control**

On a conventional turning center, polar coordinate interpolation is used for tool motion control during grooving and contouring, as illustrated in the left figure. In this control mode, however, the X-axis travel direction is reversed at points "a", the intersections between the workpiece center line and the profile to be machined. This reversal changes cutting conditions and subsequently effects profile accuracy. Machining with Y-axis control, on the other hand, is free of such changes and ensures a high level of profile accuracy.
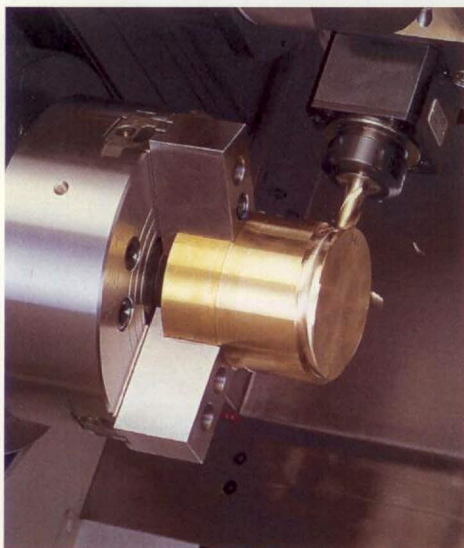
● Grooving

● Contouring

Quadrant projection (a)

Polar coordinate interpolation

Y-axis control

● Points "a", intersections between the workpiece center line and the profile to be machined.
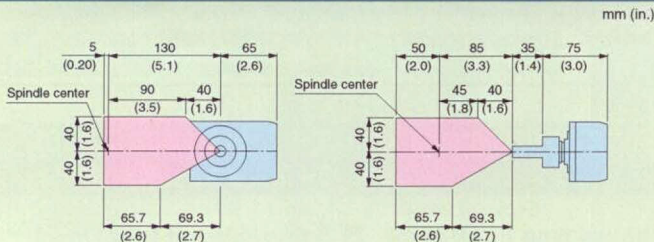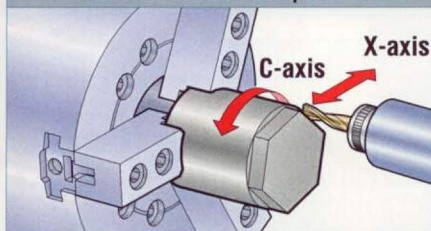

Turning center

Milling is possible during spindle rotation. High precision contour control is delivered from a DDS* motor acting as the C-axis indexing servo.
(The photo shows ZT2500Y.)
* Direct Drive Spindle

Standard features

Polar coordinate interpolation

C-axis

X-axis

Cylindrical interpolation

Z-axis

C-axis

Rigid tap feature, Miracle tap feature

Special holder not required
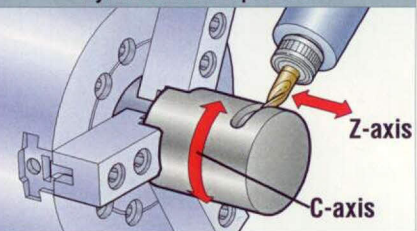
Rotary tools can be mounted
- M12 tap ● φ 13 mm (φ 0.5 in.) drill
- φ 13 mm (φ 0.5 in.) end mill

C-axis rapid travers rate

Previous model
200 min⁻¹

×2.0

ZT1000Y
400 min⁻¹

C-axis exchanging time

90° : **0.52** sec.

180° : **0.54** sec.

270° : **0.56** sec.

● The cutting test results indicated in this catalog are provided as an example. The results indicated in this catalog may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

Spindle

High-output spindle for machining diverse types of workpieces.
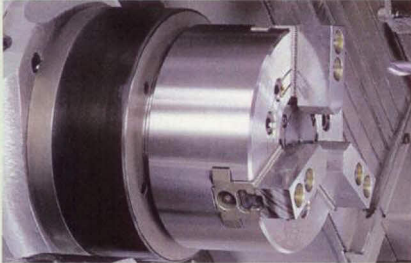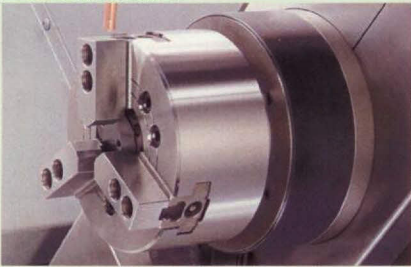
- For 5-/6-inch chuck
- Through spindle hole diameter 49 mm (1.9 in.)
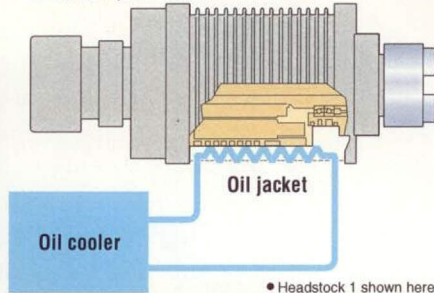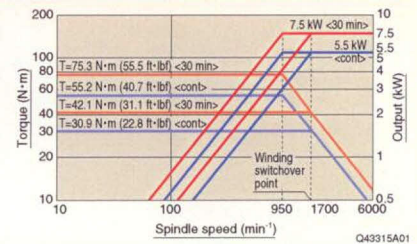
Headstock 1

Headstock 2

Oil cooler included as standard equipment

- Both spindles (headstock 1 spindle and headstock 2 spindle) are wrapped in an oil jacket to minimize thermal displacement.
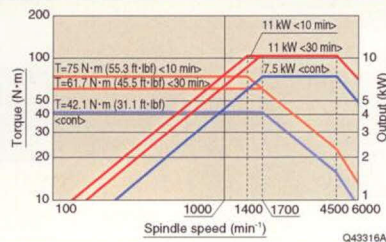
Oil jacket

Oil cooler

- Headstock 1 shown here.

Standard

6,000 min⁻¹ | **7.5/5.5 kW (10/7.5 HP) <30 min/cont>**

T=75.3 N·m (55.5 ft·lbf) <30 min>
T=55.2 N·m (40.7 ft·lbf) <cont>
T=42.1 N·m (31.1 ft·lbf) <30 min>
T=30.9 N·m (22.8 ft·lbf) <cont>

7.5 kW <30 min>
5.5 kW <cont>

Winding switchover point

Torque (N·m) / Output (kW) / Spindle speed (min⁻¹)

Q43315A01

High output *

6,000 min⁻¹ | **11/7.5 kW (15/10 HP) <10 min/30 min/cont>**

T=75 N·m (55.3 ft·lbf) <10 min>
T=61.7 N·m (45.5 ft·lbf) <30 min>
T=42.1 N·m (31.1 ft·lbf) <cont>

11 kW <10 min>
11 kW <30 min>
7.5 kW <cont>

Torque (N·m) / Output (kW) / Spindle speed (min⁻¹)

Q43316A01

High speed *

8,000 min⁻¹ | **22/18.5 kW (30/24.7 HP) <15 min/cont>**
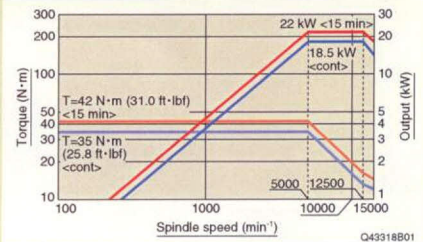
T=42 N·m (31.0 ft·lbf) <15 min>
T=35 N·m (25.8 ft·lbf) <cont>

22 kW <15 min>
18.5 kW <cont>

Torque (N·m) / Output (kW) / Spindle speed (min⁻¹)

Q43318B01

* Option

Turret

Quick-change type turret head (VDI)
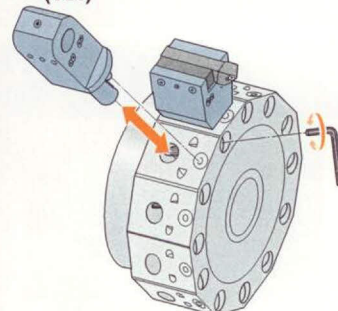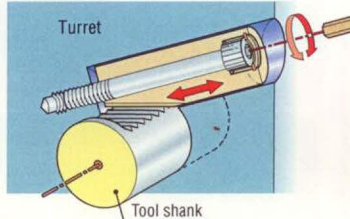
Bolt-tightened turret head (option)

Clamp mechanism

Turret

Tool shank

Dual turrets come standard including a quick-change type turret for VDI tools. This drastically shortens tool change time. (The photo shows 16-tool specification.)
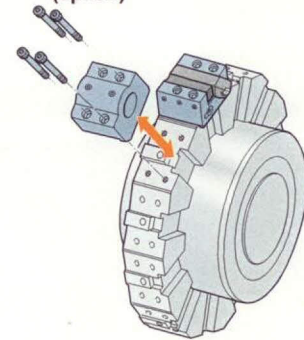
Indexing time (1-station) — **0.2 sec.**

Number of tool stations (turret 1+2) — **32 (16+16)* tools**

* Option

Rotary tool spindle

6,000 min⁻¹ | **3.7/2.2 kW (5/3 HP) <15 min/cont>**
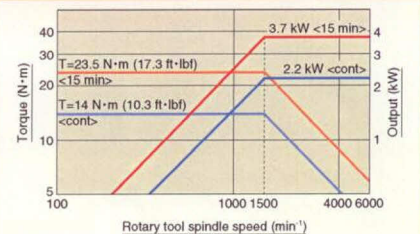
T=23.5 N·m (17.3 ft·lbf) <15 min>
T=14 N·m (10.3 ft·lbf) <cont>

3.7 kW <15 min>
2.2 kW <cont>

Torque (N·m) / Output (kW) / Rotary tool spindle speed (min⁻¹)

Q43317A01

8

Processing speed

Tapping (O.D.): M12×P1.75
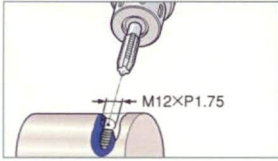
Material <JIS>	S45C*1
Rotary tool spindle speed	398 min-1
Feedrate	1.75 mm/rev (0.069 ipr)
Cutting speed	15 m/min (49.2 fpm)

M12×P1.75

Drilling

φ 13 mm (φ 0.5 in.)
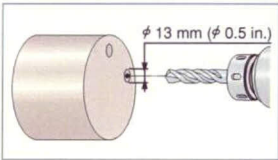
Material <JIS>	S45C*1
Rotary tool spindle speed	612 min-1
Cutting speed	25 m/min (82.0 fpm)
Feedrate	0.24 mm/rev (0.009 ipr)
Machining rate per minute	19.5 mL/min (1.2 in3./min)

End mill

10 mm (0.4 in.) φ 12 mm (φ 0.5 in.)
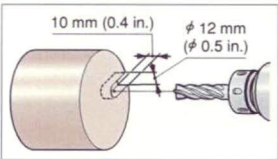
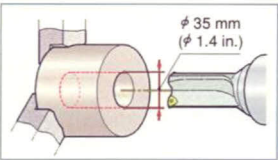| Material <JIS>	S45C*1
Rotary tool spindle speed	530 min-1
Cutting speed	20 m/min (65.6 fpm)
Feedrate	0.2 mm/rev (0.008 ipr)
Machining rate per minute	12.7 mL/min (0.8 in3./min)

Throw-away drill

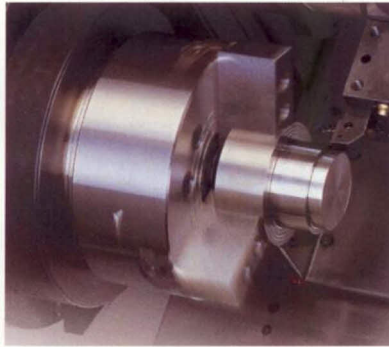φ 35 mm (φ 1.4 in.)

Material <JIS>	S45C*1
Spindle speed	1,091 min-1
Cutting speed	120 m/min (393.7 fpm)
Feedrate	0.22 mm/rev (0.009 ipr)
Machining rate per minute	230.9 mL/min (14.1 in3./min)

*1 Carbon steel
*2 Direct Drive Spindle

Heavy-duty cutting

■ Headstock 1, Turret 1

Making full use of the high output DDS*2 motor, heavy-duty O.D. cutting is powerful and precise even with large workpieces.

Machining rate per minute

162.7 mL/min
(9.9 in3./min)

Depth of cut

6 mm (0.24 in.)

Material <JIS>	S45C*1
Outer diameter	80 mm (3.1 in.)
Cutting speed	120 m/min (393.7 fpm)
Feedrate	0.2 mm/rev (0.008 ipr)

Balanced cutting

■ Headstock 1

Turrets 1 and 2 move synchronously in O.D. cutting to ensure high precision balanced cutting.
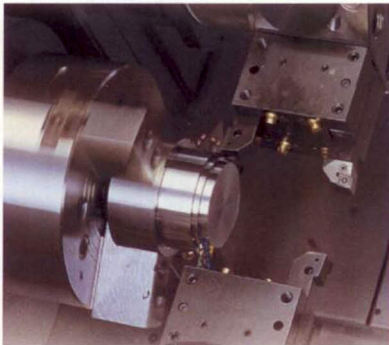
JIS: Japanese Industrial Standard

High precision

Turning precision

10 μm
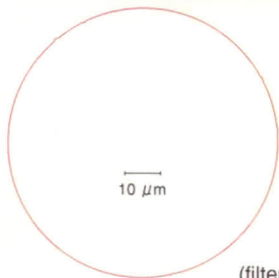
(filter: 1—50)
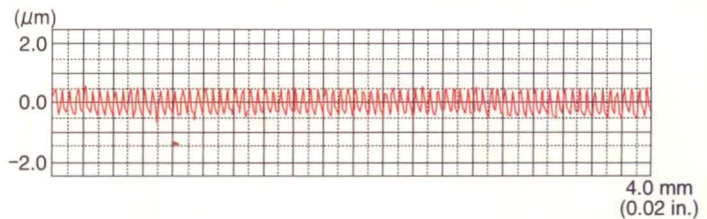
Tool	Diamond tool <nose radius 0.4 mm (0.02 in.)>
Material	Brass
Outer diameter	40 mm (1.6 in.)
Spindle speed	1,000 min-1
Feedrate	0.05 mm/rev (0.002 ipr)

Roundness

0.43 μm

(μm)
2.0
0.0
-2.0
4.0 mm (0.02 in.)

Tool	Diamond tool <nose radius 0.4 mm (0.02 in.)>
Material	Brass
Outer diameter	40 mm (1.6 in.)
Spindle speed	3,000 min-1
Feedrate	0.05 mm/rev (0.002 ipr)

Surface roughness

1.07 μm Ry

● The cutting test results indicated in this catalog are provided as an example. The results indicated in this catalog may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

Superior rigidity
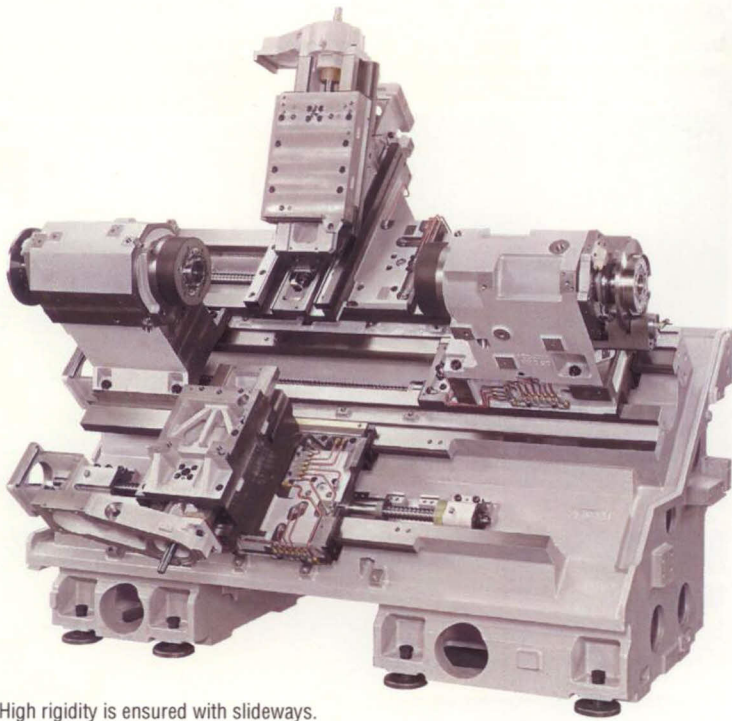
High rigidity is ensured with slideways.
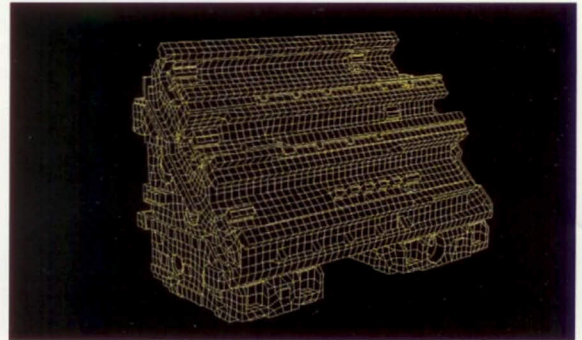
Ribbing was optimized by FEM* analysis.
* Finite Element Method

■ Carefully designed ribbing

Achieves excellent chip removal by using a 45° slant construction.

45°
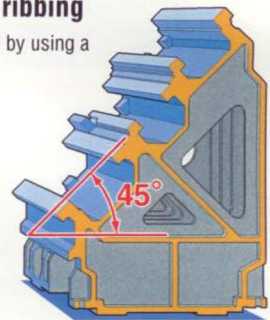
Operability, Safety device

Carefully tailored ergonomic operating environment.

Adjustable operating panel

0 — 90°

Swinging the operation panel reduces eye strain and improves operability.

Built for safety

Door interlock system

Polycarbonate (exterior)
Tempered glass (interior)
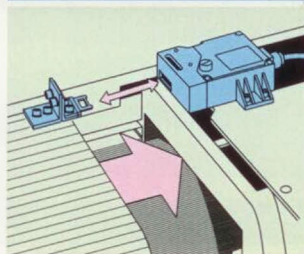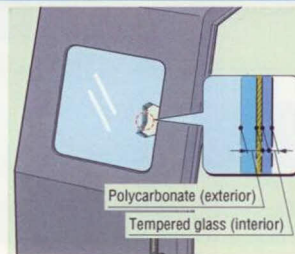
Impact resistant viewing window
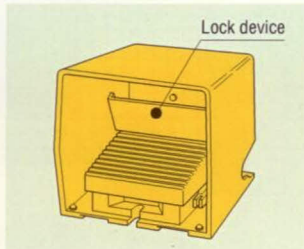
Lock device

Footswitch with lock device
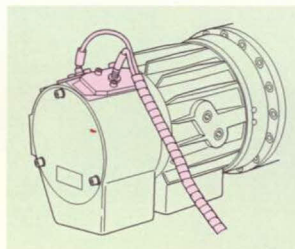
Chuck jaw stroke end check*1

- Full cover • Cylinder check valve*1 • Low air pressure detecting switch
- Low hydraulic pressure detecting switch
- Danger sensing device interface*2 (option)
- Earth leakage breaker (option) • Workpiece holding detector (option)

*1 Featured only when optional chuck/cylinder is selected.
*2 Recommended when oil-based coolant is used or during unmanned operation.

Operability

Smaller maintenance area since the coolant tanks both pull forward, thereby allowing a shorter right-side pull-out distance.

High maintainability

Allows the lubricating oil level to be checked at one glance by opening the cover of the control panel.

In-machine traveling parts catcher system (option)

Parts catcher can receive workpieces from both spindles. And, unmanned operation is possible when coupled with a workpiece transporting conveyor.

■ Receiver type

Headstock 1 side

Headstock 2 side
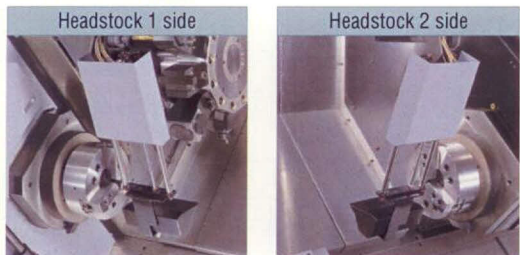
(The photo shows ZT2500Y.)

In-machine traveling parts catcher (receiver type)

■ Single-hand type

Workpiece transporting conveyor

Workpiece bucket

In-machine traveling parts catcher specification		
Hand model	Receiver type	Single-hand type
Max. transfer weight	1.2 kg (2.6 lb.)	
Max. speed <Z-axis>	100 m/min (328.1 fpm)	
Applicable workpiece — Outer diameter	40 mm (1.6 in.)	10—40 mm (0.4—1.6 in.)
Applicable workpiece — Length	20—120 mm (0.8—4.7 in.)	
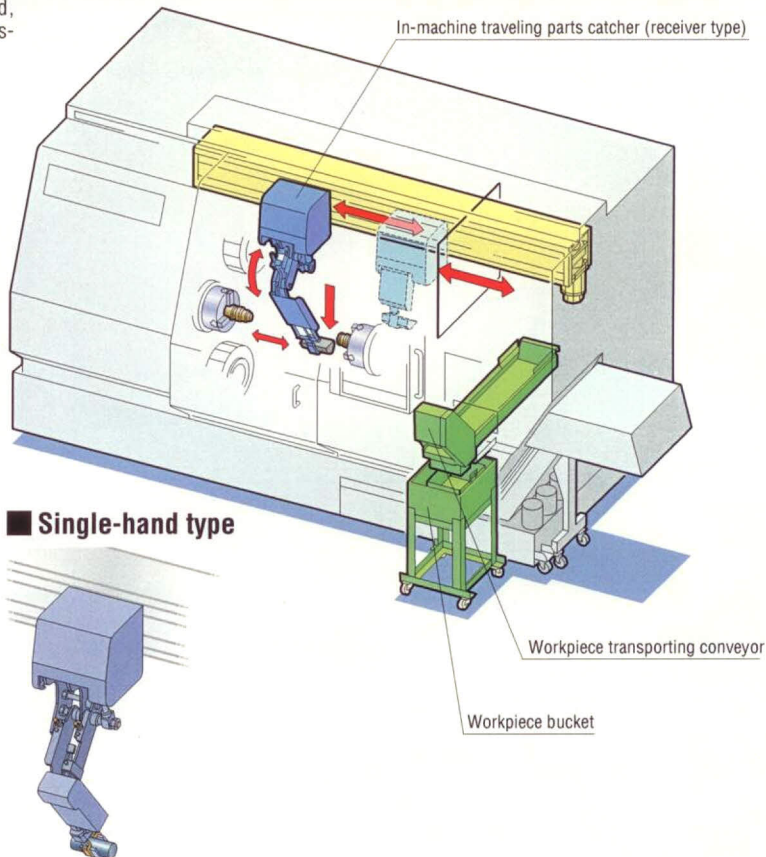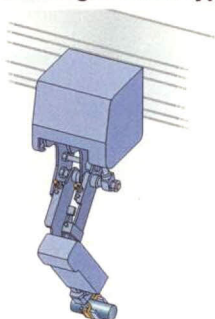
Bar feeder system (option)

Complete bar machining is possible on a single machine when coupled with a parts catcher. You won't need a work loader/unloader or turnover unit.

In-machine traveling parts catcher (receiver type)

Workpiece transporting conveyor

Bar feeder

Workpiece bucket
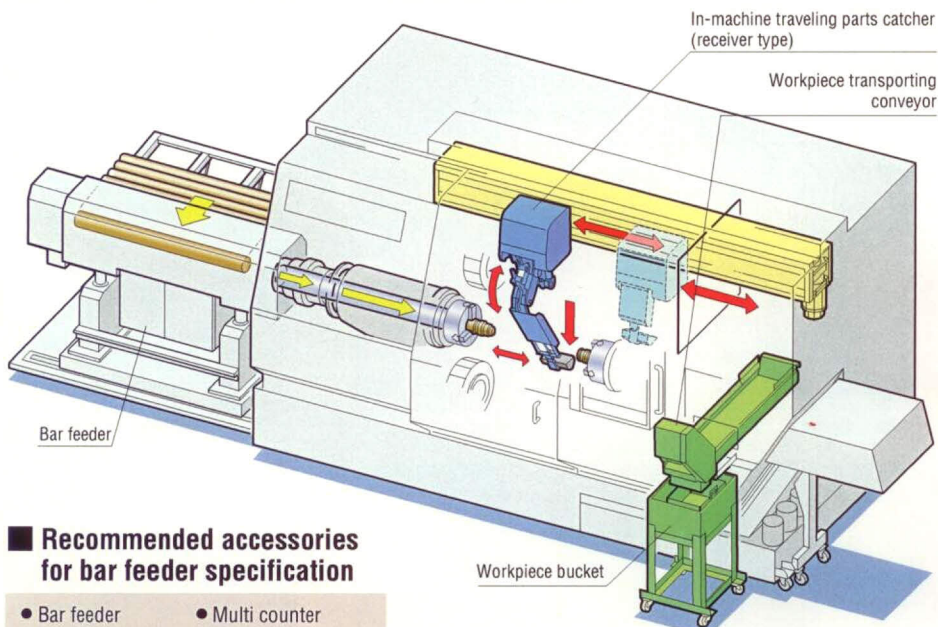
■ Recommended accessories for bar feeder specification

- Bar feeder
- Signal tower
- Work stopper
- Multi counter
- Guide bushing

Standard features
Tool life management function B (monitor)
Load monitoring function (monitor)
Work counter (monitor)
Total counter (monitor)

Optional features
Work counter
Total counter

Bar work capacity

ϕ **40** mm*
(ϕ 1.5 in.)

Company A ϕ 34 mm (ϕ 1.3 in.)	×1.2
Company B ϕ 36 mm (ϕ 1.4 in.)	×1.1
ZT1000Y ϕ 40 mm (ϕ 1.5 in.)	

* Depending on the chuck/cylinder used and it's restrictions, it may not be possible to reach full bar work capacity.

Standard & optional equipment

Automatic operation support

Spindle

Safety features

Operation support device/function

Chip disposal

Turret 2

Coolant

Workpiece holding device
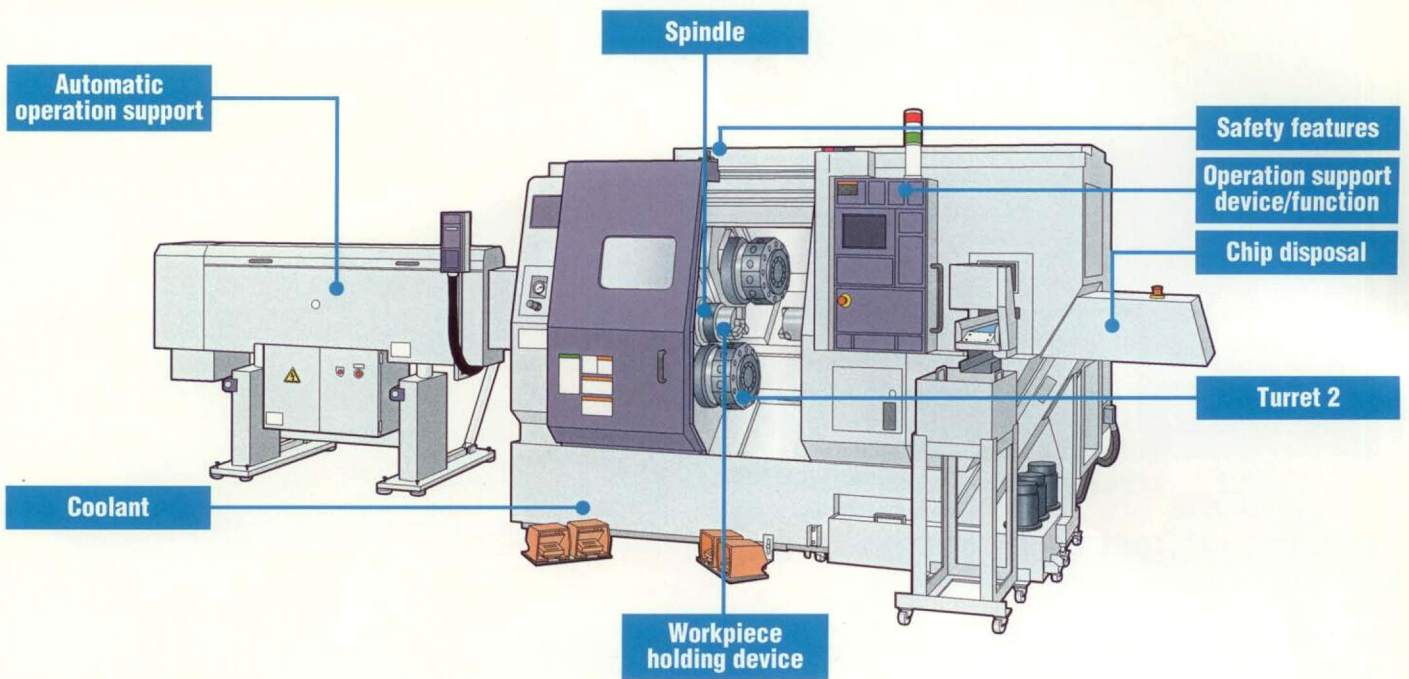
Chip disposal, Automatic operation support

Workpiece transporting conveyor

Chip conveyor

Workpiece bucket
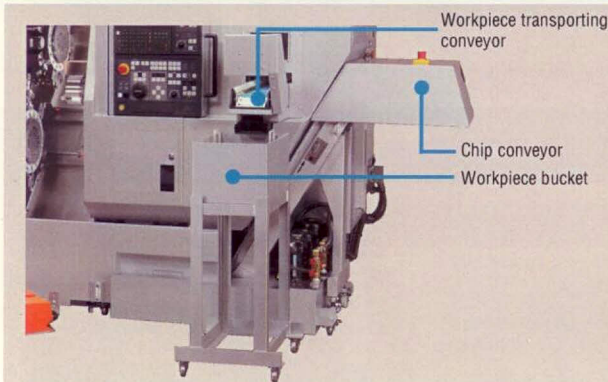
■ Chip conveyor (option)*

Hinge type
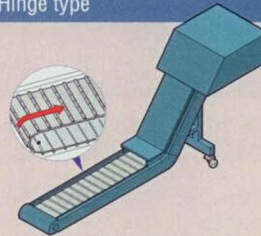
Scraper type
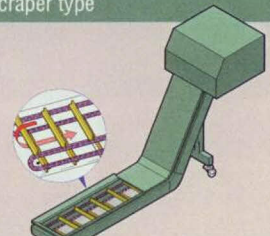
* Chip conveyors are available in various types for handling chips of different shape and material.
● For details contact Mori Seiki.
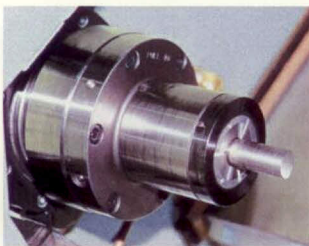
Collet chuck
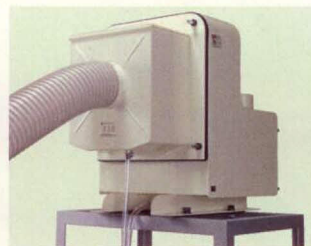
Oil mist collector
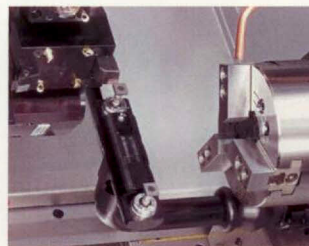
Tool presetter

Guide bushing

Bar material

Bar material
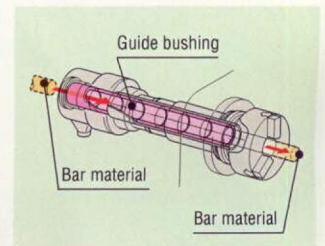
Guide bushing

Work counter
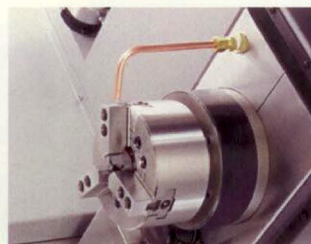
Chuck air blow
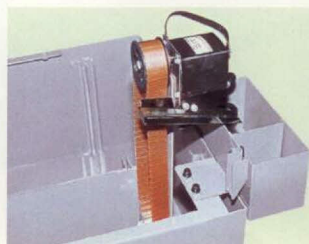
Oil skimmer
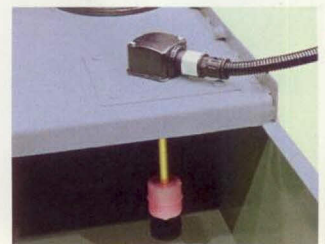
Coolant float switch

● The colors and configuration shown in the photographs may differ from those of the actual product.

Standard & optional features

Spindle

Max. spindle speed <headstock 1>	6,000 min⁻¹ <7.5/5.5 kW (10/7.5 HP)*¹>	●
	6,000 min⁻¹ <11/7.5 kW (15/10 HP)*¹>	○
	8,000 min⁻¹ <22/18.5 kW (30/24.7 HP)*¹>	☆
Max. spindle speed <headstock 2>	6,000 min⁻¹ <7.5/5.5 kW (10/7.5 HP)*¹>	●
	6,000 min⁻¹ <11/7.5 kW (15/10 HP)*¹>	○
	8,000 min⁻¹ <22/18.5 kW (30/24.7 HP)*¹>	☆
Oil cooler		●
Spindle orientation		○

Turret

Quick-change type turret head	12-station <shank diameter 25 mm (1 in.)>	●
	16-station <shank diameter 25 mm (1 in.)>	○
Bolt-tightened turret head	12-station <metric specification>	☆
	16-station <metric specification>	☆
	12-station <inch specification>	☆
	16-station <inch specification>	☆
Max. rotary tool spindle speed	6,000 min⁻¹ <3.7/2.2 kW (5/3 HP)*²>	●

Workpiece holding device

Hydraulic chuck	5-inch <headstock 1>	○
	6-inch <headstock 1>	○
	5-inch <headstock 2>	○
	6-inch <headstock 2>	○
Collet chuck	Nominal diameter 40 mm (1.6 in.)	○
Chuck high/low pressure system		○
Index chuck <headstock 1>	Interface 0.75 kW (1 HP)	○
	Interface 1.5 kW (2 HP)	○
Soft jaws		○

Coolant

Coolant system	325/520 W <50/60 Hz>	●
High-pressure coolant system	635/1,040 W <50/60 Hz>	○
Coolant cooling unit		○
Coolant float switch		☆
Oil skimmer		○

Automatic operation support

In-machine traveling parts catcher	Receiver	○
	Single-hand type	○
Workpiece transporting conveyor		○
Workpiece bucket		○
Workpiece push-out equipment		○
Work pusher		☆
Bar feeder		○
Gantry-type loader		☆
Work stocker		☆
Pull-out finger		☆
Guide bushing		☆
Work stopper		○

Operation support device/function

Work counter	○
Total counter	○
Multi counter	☆
Automatic door	○
Automatic power off system	○

Improved accuracy

Direct scale feedback	C-axis	○
	X-axis	○
	Y-axis	○
	Z-axis	○

Measurement

|		
Automatic measuring system	Optical touch sensor	○
Manual type in-machine tool presetter	Removable	●
Automatic in-machine tool presetter		☆

Chip disposal

Chip conveyor <outside machine>	Hinge type <right>	○
	Scraper type <right>	☆
	Hinge type <rear>	○
	Scraper type <rear>	☆
	Interface	☆
Chip removable coolant system*³		●
Air blow system	Chuck*⁴ <headstock 1>	○
	In-machine tool presetter	☆
	Tool tip	☆
Chip bucket		○
Coolant gun		○
Oil mist collector		☆

Others

Built-in worklight		●
Tool holders		●
Hand tools		●
Signal tower	3-stage	○
Chuck foot switch	2 foot switches	○
Work stopper <in spindle>		☆

Safety features

Door interlock system	●
Impact resistant viewing window	●
Chuck jaw stroke end check*⁵	●
Low hydraulic pressure detecting switch	●
Footswitch with lock device	●
Full cover	●
Cylinder check valve*⁵	●
Low air pressure detecting switch	●
Danger sensing device interface*⁶	○
Earth leakage breaker	○
Workpiece holding detector	☆

＊1 30 min/cont
＊2 15 min/cont
＊3 For rear extraction type chip conveyor. Right extraction style is optional.
＊4 Headstock 2 is standard.
＊5 Featured only when optional chuck/cylinder is selected.
＊6 Recommended when oil-based coolant is used or during unmanned operation.

● The details given above and the specifications are subject to change without notice.
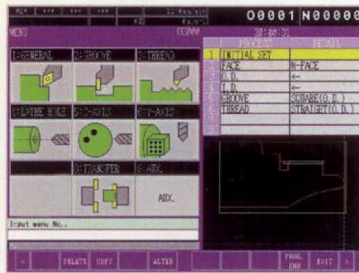● Specifications, accessories, safety device, and function are available upon request.
● Some options are not available in particular regions. For details contact Mori Seiki.

New generation operating system MAPPS [1]

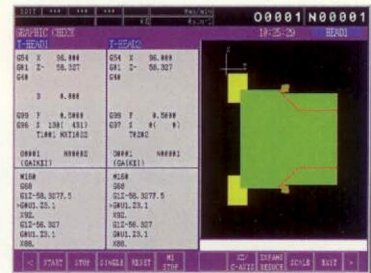### ■ Conversational automatic programming

By inputting the final shape of the workpiece, the MAPPS can automatically select the necessary tools, cutting conditions and the most efficient machining sequence, thus minimizing the amount of input.

■ Program editing

Two programs can be opened at the same time and data copied & pasted between them.

■ Simulation

A simulated image of the machining workpiece can be displayed to check programming. [2]

■ Network (option)
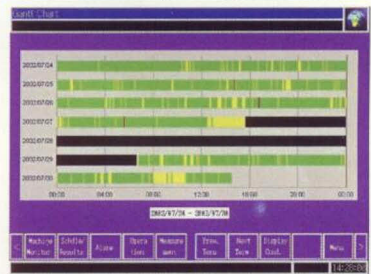
Using CAPS-NET, users can build a factory floor network over Ethernet (10 Base-T). Networking allows users to centrally and efficiently monitor and plan production.

[1] Mori Advanced Programming Production System　[2] Some machining programs cannot be graphically simulated.

Conversational Automatic Programming Software for two-spindle, two-turret Turning Centers
CAPS-ZT (option)

■ Automatic programming software

Supports complex multi-axis programming, such as turning, C-axis and Y-axis machining, sub-spindles, and balance cutting.
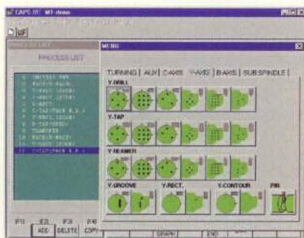
Y-axis machining menu

■ 2 turrets machining
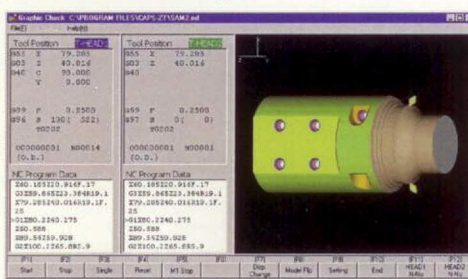
Easy creation of programs for balance cutting and synchronizing the No. 1 and No. 2 turrets.

PC [1] requirements

Item	Requirement
Hardware	PC/AT compatible
	DOS/V
CPU	Pentium® III 1 GHz or more
	NC processor
Graphics	SVGA (min. 800×600 resolution and 65,536 colors)
Memory	128 MB or more
Hard disk	50 MB or more available area required
O/S	Windows® 95/98/Me/NT 4.0 Workstation/ 2000 Professional/XP
Other	CD-ROM drive, Parallel port D-SUB 25 pin [2], Serial port

■ Detailed setup possible
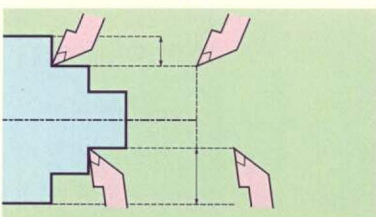
By delaying the position where the cutting begins, we doubled the amount of material cut.
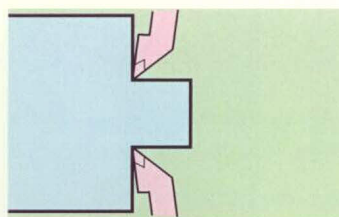
By synchronizing tool movement, we raised the amount of feed.

[1] Personal Computer
[2] USB conversion is not possible.
● The product names indicated in this catalog are all trademarks or registered trademarks of the individual companies.

NC unit specifications (MSG-501)

Standard

Controlled axes

Controlled axes	H 1: X, Z, C, Y H 2: X, Z, C, B
Simultaneously controllable axes	H 1: X, Z, C, Y H 2: X, Z, C
Least input increment	0.001 mm (0.0001 in.)
Least command increment	0.001 mm (0.0001 in.)
Max. command value	±99,999.999 mm (±9,999.9999 in.)
Inch/metric conversion	G20/G21
Interlock*¹	
Machine lock	
Emergency stop	
Stored stroke limit 1	
Programmable mirror image	M code
Follow-up	
Chamfering ON/OFF	
Backlash compensation	±9,999 pulses
Rapid traverse/cutting feed backlash compensation	
Stored pitch error compensation	
Abnormal load detection	Used for software damper and load monitor B
Cutting feedrate	

Operation

Search function	Workpiece number, Sequence number
Manual intervention/return	
Dry run	
Single block	
Jog feedrate	0—1,260 mm/min (0—50.0 ipm) <15 steps>
Manual zero return	
Zero point setting without dog	
Manual pulse handle feed	1 unit per control system: ×1, ×10, ×100

Interpolation functions

Positioning	G00 (Linear interpolation type positioning is possible)
Linear interpolation	G01
Circular interpolation	G02/G03 (CW/CCW)
Dwell	G04
Polar coordinate interpolation	G12.1, G13.1 (G112, G113)
Cylindrical interpolation	G7.1 (G107)
Helical interpolation	
Thread cutting/Synchronous feed	
Multi-start thread cutting	
Retract during thread cutting cycle	
Continuous thread cutting	
Skip	G31
Zero return	G28
Zero return check	G27
2nd zero return	G30
Balance cut	

Feed functions

Rapid traverse rate override	F0, 25/100 %
Feed per minute	G98
Feed per revolution	G99
Constant tangential velocity control	
Cutting feedrate clamp	
Feedrate override	0—150 % (10 % increments)
Jog feedrate override	0—1,260 mm/min (0—50.0 ipm)
Override cancel	M48, M49

Program input

Tape code	EIA RS244/ISO 840 code automatic recognition
Label skip	
Optional block skip	1 block
Max. command value	±8 digits
Program number	4-digit O code
Sequence number	5-digit N code
Absolute (incremental) programming	X (U), Z (W), Y (V), C (H)
Decimal point programming/ Electrical calculator type decimal point programming	Electrical calculator type decimal point programming is changeable using parameter
Plane selection	G17, G18, G19
Coordinate system setting	G50
Work coordinate system	G52, G53, G54—G59
Manual absolute on/off	PC parameter
Drawing dimension direct input	
Sub-program call	Up to 4 nestings
Single repetitive cycle	
Multiple repetitive cycle	
Multiple repetitive cycle II	Pocket profile, zigzag thread cutting
Hole machining canned cycle	
Circular arc radius command	
F15 format	

Miscellaneous function/Spindle speed function

Miscellaneous function	3-digit M code
Auxiliary function lock	
Spindle speed function	5-digit S code
Constant surface speed control	
Spindle speed override	50—120 % (10 % increments)
Synchronized tapping	With rotary tool spindle
Spindle synchronized control	

Tool function/Tool offset function

Tool function (T function)	4-digit T code
Number of tool offsets	64+64 sets
Tool position offset	
Y-axis offset	
Tool nose radius offset	G40—G42
Tool geometry offset/Tool wear offset	
Tool life management B	

Editing

Part program storage	80+80 m (262+262 ft) <4 kB≒10 m (33 ft) in tape length>
Number of stored programs	63+63 programs
Tape editing	
Program protect	
Background editing	
Expanded tape editing	

Setting and display

Status display	
Clock function	
Actual position display	
Program display	Program name: 48 characters
Parameter setting display	
Self-diagnosis function	
Alarm display	
Alarm history display	
Operator's message history display	
Running time display/No. of parts display	
Actual feedrate display	
Display of actual spindle speed and T code	
Operation panel: Display section	10.4-inch TFT color LCD

Data Input/Output

Reader/puncher interface	RS-232-C (ch-1)
Memory card interface	PCMCIA (type I , II)

Option

Additional part program storage <in total>	160+160/320+320/640+640/1,280+1,280 m (525+525/1,050+1,050/2,100+2,100/4,200+4,200 ft)
Additional number of stored programs <in total>	125+125*²/200+200*²/400+400*³/ 1,000+1,000*⁴ programs
Additional number of tool offsets <in total>	99+99 sets

☐ Programming resolution 1/10 <0.0001 mm (0.00001 in.)> ☐ Stored stroke limit 2, 3
☐ Stroke check before movement ☐ Chuck and tailstock barrier ☐ Sequence number collation and stop
☐ Program restart ☐ Manual handle feed interruption ☐ Variable lead thread cutting <G34>
☐ Circular thread cutting ☐ High-speed skip ☐ Multi-skip ☐ 3rd and 4th zero return
☐ Floating zero return <G30.1> ☐ Feed stop ☐ Addition of optional block skip <9 blocks>
☐ Programming resolution multiplied by 10*⁵ ☐ G code system <B/C> ☐ Programmable data input <G10>
☐ Custom macro ☐ Additional custom macro common variables <#100—#199, #500—#999>
☐ Interruption type custom macro ☐ 9-digit circular arc radius command ☐ Spindle 1 orientation
☐ Spindle 2 orientation ☐ Corner circular interpolation <G39> ☐ Playback
☐ Reader/puncher interface <ch-2> ☐ External work number search <workpiece number: 1—15>

I95077A06

*1 External-input controlled axis interlock is optional.
   Interlock is not possible for user-selected axis.
*2 Min. 40 m (131 ft) tape recording length required.
*3 Min. 80 m (262 ft) tape recording length required.
*4 Min. 320 m (1,050 ft) tape recording length required.
*5 Only for metric specification. Not available in inch specifications.
   (Control axes only. Not available for feed.)

Machine specifications

	Item		ZT1000Y
Capacity	Max. swing of workpiece	mm (in.)	250 (9.8) <interference with turret cover>
	Max. distance between centers	mm (in.)	750 (29.5)
	Max. turning diameter	mm (in.)	190 (7.4)
	Standard turning diameter	mm (in.)	170 (6.6)
	Max. turning length	mm (in.)	120 (4.7)
	Bar work capacity *1	mm (in.)	40 (1.5)
Travel	X-axis travel	mm (in.)	No. 1: 135 (5.3) No. 2: 135 (5.3)
	Z-axis travel	mm (in.)	No. 1: 450 (17.7) No. 2: 440 (17.3)
	Y-axis travel	mm (in.)	±40 (±1.6)
	Headstock 2 travel <B-axis>	mm (in.)	510 (20.1)
Spindle	Spindle speed range *2	min⁻¹	60−6,000 [80−8,000]
	Number of spindle speed ranges		1
	Type of spindle nose		JIS A2-5
	Through spindle hole diameter	mm (in.)	49 (1.9)
	Spindle bearing inner diameter	mm (in.)	80 (3.1)
	Min. spindle indexing angle		0.001° <least input increment>
Turret	Number of tool stations		12 [16]
	Shank height for square tool	mm (in.)	20 ($3/4$)
	Shank diameter for boring bar	mm (in.)	25 (1)
	Turret indexing time	s	0.2
	Max. rotary tool spindle speed *2	min⁻¹	6,000
Feedrate	Rapid traverse rate	mm/min (ipm)	X1, X2: 18,000 (708.7) Z1, Z2: 24,000 (944.9) Y: 6,000 (236.2) B: 24,000 (944.9) C: 400 min⁻¹
	Jog feedrate	mm/min (ipm)	X, Z, B: 0−1,260 (0−50.0)
Motor	Spindle drive motor <30 min/cont>	kW (HP)	7.5/5.5 (10/7.5) [11/7.5 (15/10)] [22/18.5 (30/24.7) *4*5]
	Rotary tool spindle drive motor <15 min/cont>	kW (HP)	3.7/2.2 (5/3)
	Feed motor <X1/X2/Z1/Z2/Y/B>	kW (HP)	3/2/3/3/1.5/3 (4/2.7/4/4/2/4)
	Coolant pump motor	kW (HP)	0.52×2 (0.70×2)
Power sources	Electrical power supply *3	kVA	46.0 [52.7 *6] [92.7 *7]
	Compressed air supply	MPa (psi), L/min (gpm)	0.5 (72.5), 100 (26.4) <ANR *8>
Tank capacity	Coolant tank capacity	L (gal.)	200 (52.8)
Machine size	Machine height <from floor>	mm (in.)	1,995 (78.5)
	Floor space <chip conveyor not included>	mm (in.)	2,797×2,010 (110.1×79.1)
	Mass of machine	kg (lb.)	5,000 (11,000)

[ ] Option No. 1: Turret 1 No. 2: Turret 2 JIS: Japanese Industrial Standard

I94215A02

*1 Depending on the chuck/cylinder used and it's restrictions, it may not be possible to reach full bar work capacity.
*2 Depending on restrictions imposed by the workpiece clamping device, fixture and tool used, it may not be possible to rotate at the maximum spindle speed.
*3 Loader/Parts catcher not included. The electrical power requirements vary depending on the option combinations.
*4 At 8,000 min⁻¹
*5 15 min/cont
*6 High-output specifications for headstock 1 and headstock 2.
*7 High-speed specifications for headstock 1 and headstock 2.
*8 ANR refers to a standard atmospheric state; i. e., temperature at 20 ℃ (68 ˚F); absolute pressure at 101.3 kPa (14.7 psi); and relative humidity at 65 %.

● The information in this catalog is valid as of August 2002. Design and specifications subject to change without notice.
● Mori Seiki is not responsible for differences between the information in the catalog and the actual machine.

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● The export of this product is subject to an authorization from the government of the exporting country.
  Check with the government agency for authorization.